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U. S. DEPARTMENT OF AGRICULTURE.
DIVISION OF ENTOMOLOGY.
BULLETIN No. 16.

THE ENTOMOLOGICAL WRITINGS

OF

DR. ALPHEUS SPRING PACKARD.

BY

SAMUEL HENSHAW.

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LETTER OF SUBMITTAL.

U. S. DEPARTMENT OF AGRICULTURE,
DIVISION OF ENTOMOLOGY,
Washington, D. C., July 5, 1887.

SIR: I have the honor to submit for publication Bulletin No. 16 of this Division, being a list of the entomological writings of Dr. A. S. Packard, with systematic and general index, prepared by Mr. Samuel Henshaw. Dr. Packard has been so long and favorably known as a writer upon insects both in their structural, biologic, and economic relations, and has been for so many years connected with Government entomological work, that this Bulletin will be welcomed by all interested in the subject and of great aid in the divisional work.

Respectfully,

C. V. RILEY,
Entomologist.

Hon. NORMAN J. COLMAN,
Commissioner of Agriculture.

THE ENTOMOLOGICAL WRITINGS OF ALPHEUS SPRING PACKARD.

By Samuel Henshaw.

Alpheus Spring Packard was born in Brunswick, Me., February 19, 1839. His father was Alpheus Spring Packard, D. D., for over sixty years a professor in Bowdoin College. His mother was Frances E. Appleton, daughter of Rev. Jesse Appleton, president of Bowdoin College. After graduating from Bowdoin College in 1861, he spent three years at the Cambridge Museum of Comparative Zoology as a student of Prof. L. Agassiz. For a part of one year (1863–'64) he was the private assistant of Professor Agassiz.

Two summers (those of 1860 and 1864) were passed upon the coast of Labrador, where collections of marine invertebrates, insects, and quaternary fossils were accumulated for future investigations. In 1861–'62 he was assistant to the Maine Geological Survey. In 1864 he took the degree of Doctor of Medicine at the Maine Medical School. In September of the same year Dr. Packard was commissioned assistant surgeon First Maine Veteran Volunteer Infantry, and served in the Sixth Corps until mustered out with the regiment in July, 1865. In 1865–'66 he was acting custodian and librarian of the Boston Society of Natural History. Dr. Packard spent eleven years (1867–'78) in Salem. Appointed in 1867 one of the curators of the Peabody Academy, he was for about two years (1877–'78) the director of its museum. At Salem he established a summer school of biology, and in March, 1868, the first number of the American Naturalist was issued. Dr. Packard was one of the originators of this magazine, and for twenty years its editor-in-chief.

In 1867 he married Elizabeth Derby, daughter of Samuel B. Walcott of Salem, and has had four children, of whom a son and two daughters are living. As lecturer or instructor Dr. Packard has been connected with the Anderson School of Natural History, Bowdoin College, and the Maine and Massachusetts State Agricultural Colleges; as assistant he has been attached to the Kentucky Geological Survey, to Hayden's United States Geological Survey of the Territories, and to the United States Fish Commission. When in search of material for his studies

Dr. Packard has visited many parts of the United States and Mexico, and has dredged upon the coast of Labrador, in the Gulf of Maine, in Massachusetts and Buzzards Bays, off Beaufort, N. C., and upon the coast of Florida.

In 1871–'73 he served as State entomologist of Massachusetts, and from 1877–'82 was a member of the United States Entomological Commission. In 1878 he accepted the professorship of Zoology and Geology in Brown University, and still retains the position.

Dr. Packard was elected a member of the National Academy in 1872 and honorary member of the Entomological Society of London in 1884, and at home and abroad a number of societies have elected him to membership.

The entomological writings of Dr. A. S. Packard, recorded in Part I of the present list, form but a portion of his contributions to science. His memoirs in other branches in range cover the field of zoology, with occasional papers in allied sciences, and bear testimony alike to his versatility and the energy of his mind.

As a rule only the original place of publication is recorded, though a few reprints and reviews are included, as of possible value in case the original is inaccessible.

Dr. Packard's contributions to the natural history of *Limulus* are included in the present bibliography, because much of the discussion concerning the anatomy, genealogy, &c., of this animal bears directly upon the *Arachnida* and other *Arthropoda*.

Part II contains a systematic list of the new names proposed by Dr. Packard, and I have endeavored to note the collection containing the type, but in many cases have been unable to do so.

A number of the types noted as present in the collection of the Museum of Comparative Zoology are, however, in a very poor state of preservation, so that a word of explanation should be added.

The bulk of Dr. Packard's types were accumulated during his connection with, and formed part of the collection of, the Peabody Academy of Science at Salem.

From the year 1880 the Academy was without the services of an entomological assistant, so that the collections, "in spite of what care could be given them, were rapidly going to ruin," when, fortunately, in 1885, their valuable collections of insects were deposited without conditions in the museum at Cambridge, where their preservation is assured.

Dr. Packard has aided me throughout the preparation of the list, and I am indebted to Messrs. Edwards, Fernald, Hulst, Riley, and Smith for assistance in determining the value and position of many of the *Lepidoptera*. Mr. Howard has rendered a similar service with some of the parasitic *Hymenoptera*.

PART I.

CHRONOLOGICAL CATALOGUE.

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Chapter 9. Anatomy and embryology, pp. 257–279.
Chapter 17. Uses to which Locusts may be put, pp. 437–443.
Chapter 19. Locust ravages in other countries, pp. 460–477.
Appendix IX. Narrative of the first journey made in the summer of 1877, pp. 134–138.
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Chapter 9. The air-sacs of Locusts, with reference to their powers of flight, pp. 178–183.

Chapter 11. The brain of the Locust, pp. 223–242.

Appendix VII. Notes of a journey made to Utah and Idaho in the summer of 1878, pp. 69–71.

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Chapter 10. The embryological development of the Locust, pp. 263–285.

Chapter 11. The systematic position of the *Orthoptera* in relation to the other orders of Insects, pp. 286–345.

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Part II.

SYSTEMATIC INDEX OF THE NEW NAMES PROPOSED.

The first number following the name refers to the number of the paper in Part I; the second, to the page where the species is first described. The following abbreviations are used in locating the types:

A. E. S. = Collection of the American Entomological Society, Philadelphia, Pa.
A. S. P. = Collection of A. S. Packard, Providence, R. I.
B. S. N. H. = Collection of the Boston Society of Natural History, Boston, Mass.
C. H. F. = Collection of C. H. Fernald, Amherst, Mass.
H. E. = Collection of Henry Edwards, New York, N. Y.
J. A. L. = Collection of J. A. Lintner, Albany, N. Y.
M. C. Z. = Collection of the Museum of Comparative Zoology, Cambridge, Mass.
N. M. = Collection of the National Museum, Washington, D. C.
P. A. S. = Collection of the Peabody Academy of Science, Salem, Mass.
S. H. S. = Collection of S. H. Scudder, Cambridge, Mass.

ARACHNIDA.

Sarcoptidæ.
Chelyletus semivorus, 64–665.*
Dermaleichus pici-pubecentis, 64–667.*
Gamasidæ.
Argus americana, 135–740. M. C. Z.
Ixodidæ.
Ixodes albipictus, 58–366; 63–65. M. C. Z.
bovis, 58–370; 63–68. M. C. Z.
chordeilis, 63–67. M. C. Z.
cookei, 63–67. M. C. Z.
leporis-palustris, 63–67. M. C. Z.
naponensis, 63–65.
nigrolineatus, 63–66. M. C. Z.
perpunctatus, 63–68. M. C. Z.
unipunctatus, 58–370; 63–66.
Trombidiidæ.
Trombidium bulbipes, 132–264.
Hydrachnidæ.
Hydrachna tricolor, 80–108.
Thalassarachna, 80–107.
verrillii, 80–107.
Oribatidæ.
Nothrus ovivorus, 64–664.*
Bdellidæ.
Bdella marina, 133–544; 278–828. M. C. Z.
Arctiscoideæ.
Macrobiotus americanus, 121–741.*
Nemastomatidæ.
Nemastoma inops, 268–203. M. C. Z.
troglodytes, 187–160. M. C. Z.
Phalangidæ.
Phlegmacera, 268–203.
cavicoleus, 268–203. M. C. Z.
Scotolemon robustum, 187–164. A. S. P.
Chernetidæ.
Chthonius cæcus, 268–203. M. C. Z.
Obisium cavicola, 268–202. M. C. Z.

MYRIAPODA.

Lysiopetalidæ.
Cryptotrichus, 261–189.
Scoterpes copei (Spirostrephon), 91–748. M. C. Z.
Spirostrephon. *See* Scoterpes.
Chordeumidæ.
Craspedosoma ocellatus (Polydesmus), 245–428.
Polydesmidæ.
Polydesmus cavicola, 187–162. A. S. P.
See Craspedosoma.
Pauropidæ.
Pauropus lubbockii, 74–621; 97–409.

*Types not preserved. A. S. Packard.

THYSANURA.

Scolopendrellidæ.
Scolopendrella americana, 125-111.
=immaculata, Newp. A. S. P.
Campodeidæ.
Campodea americana, 84-96; 97-409.
=staphylinus, Westw.
cookei, 91-747. M. C. Z.
mexicana, 311-383.
Japyx subterraneus, 145-511. M. C. Z.
Poduridæ.
Achorutes boletivorus, 127-30. M. C. Z.
marmoratus, 127-30. M. C. Z.
pratorum, 127-31. M. C. Z.
texensis, 127-30. M. C. Z.
Anura gibbosa, 127-27. M. C. Z.
De Geeria decemfasciata, 127-40. M. C. Z.
flavocincta, 64*b*-pl. 10.
=decemfasciata, Pack. M. C. Z.
griseo-olivata, 127-39. M. C. Z.
perpulchra, 127-38. M. C. Z.
purpurascens, 64*b*-pl. 10. M. C. Z.
Isotoma albella, 127-32. M. C. Z.
belfragei, 127-33. M. C. Z.
besselsii, 179-52.
glauca, 127-33. M. C. Z.
leonina, 127-32. M. C. Z.
nivalis, 127-31. M. C. Z.
plumbeus, 64*b*-pl. 10. M. C. Z.
purpurascens, 127-34. M. C. Z.
tricolor, 127-34. M. C. Z.
walkeri, 94-19; 98-14.
Lepidocyrtus albus, 127-37.
bipunctatus, 127-37. M. C. Z.
marmoratus, 127-36.
metallicus, 127-36. M. C. Z.
Orchesella carneiceps, 127-40. M. C. Z.
flavopicta, 127-41. M. C. Z.
Papirius marmoratus, 127-42. M. C. Z.
texensis, 127-42. M. C. Z.
Smynthurus roseus, 127-43. M. C. Z.
quadrisignatus, 127-44. M. C. Z.
Lepismatidæ.
Lepisma domestica, 127-48. M. C. Z.
mucronata, 127-49. M. C. Z.
quadriseriata, 127-47. M. C. Z.
spinulata, 127-48. M. C. Z.
Machilus brevicornis, 127-49.
orbitalis, 127-50.

NEUROPTERA.

Panorpidæ.
Boreus californicus, 97-408. M. C. Z.

PSEUDONEUROPTERA.

Psocidæ.
Amphientomum hagenii, 97-405.

ORTHOPTERA.

Locustaridæ.
Ceuthophilus ensiger, 227-882. M. C. Z.
sloanii, 130-93. M. C. Z.

HEMIPTERA.

Liotheidæ.
Colpocephalum lari, 67-96.
Menopon picicola, 134-731.
Philopteridæ.
Docophorus buteonis, 67-93.
hamatus, 67-94.
syrnii, 134-733.
Goniocotes burnettii, 67-94.
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* Based on Glover's unpublished figures.

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*According to Riley this is a seasonal dimorphic form of *oxycoccana*; Fernald considers this = *minuta* Rob., and that *oxycoccana* should remain distinct.

†According to Professor Fernald this is not a Calaclysta.

‡ *Pinipestis abietivorella*, given by Grote (Check List, 1882, p. 55) as one of Packard's species, was described by Grote (Bull. U. S. Geol. Surv., v. 4, p. 701).

§ Probably varieties of *S. centuriella*, Schiff.

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=incilnata, Walk. M. C. Z.
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geminata, 128-58.
=absyntbiata, Linn. M. C. Z.
interruptofasciata, 128-59. M. C. Z.
longipalpata, 176-56. M. C. Z.
luteata, 30-46. M. C. Z.
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occidentaliata (Chesias), 96-404.
=subapicata, Guen. M. C. Z.
palpata, 128-58.
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*Described as a *Bombycid;* see Ent. Amer., 1885, v. 1, p. 167, for Hulst's reasons for placing here.

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=chamæchrysaria, Grote. M. C. Z.
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=munitata, Hübn. M. C. Z.
carneata (Phibalapteryx), 154-43, M. C. Z.
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=abrasaria, H. S. M. C. Z.
rubrosuffusata (Cidaria), 96-402. M. C. Z.
strigata (Cidaria), 30-50.
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Odezia californiata (Baptria), 96-404. M. C. Z.
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Petrophora albolineata (Cidaria), 128-55. M. C. Z.
brunneata (Cidaria), 30-47.
=truncata, Hübn. M. C. Z.
disjunctaria (Cidaria), 128-53,
=cunigerata, Walk.
flavata (Eurhinosea), 124-35. M. C. Z.
leoninata (Cidaria), 96-401. M. C. Z.
montanata (Cidaria), 128-55.
=prunata, Linn.
nubilata (Cidaria), 30-48; 96-400.
=*var. of* prunata, Linn. M. C. Z.
subochreata (Cidaria), 96-400.
=mancipata, Guen. M. C. Z.
triangulata (Cidaria), 128-54.
=prunata, Linn.
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excurvata, 154-47,
=continuata, Walk. M. C. Z.
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irrorata, 176-273. M. C. Z.
meadiata, 154-47. M. C. Z.
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=snoviata, Pack. M. C. Z.
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kodiakata (Melanippe), 124-23. =lugubrata, Staud. H. E.
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* All the species described by Dr. Packard are probably varieties of *sordidata*, Fabr.

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Selidosema californiaria, 96-394.
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Semiothisa californiata (Macaria), 96-392.
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dislocaria, 176-282. M. C. Z.
duplicaria (Macaria), 128-65.
=ocellinata, Guen. M. C. Z.
minorata (Macaria), 128-66. M. C. Z.
multilineata (Macaria), 128-65.
M. C. Z.
pallidata (Macaria), 128-64.
=californiata, Pack. M. C. Z.
punctolineata (Macaria), 128-64.
M. C. Z.
sexmaculata (Macaria), 30-44.
=granitata, Guen. M. C. Z.
S-signata (Macaria), 128-63. M. C. Z.
Sicya crocearia, 124-36.
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meskaria, 176-213. N. M.
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Synchlora albolineata, 128-75.
=glaucaria, Guen. M. C. Z.
excurvaria, 128-76. M. C. Z.
gracilaria (Eunemoria), 128-77.
=glaucaria, Guen. M. C. Z.
rubrifrontaria, 128-75. M. C. Z.
tricoloraria (Eunemoria), 124-30.
=liquoraria, Guen. M. C. Z.
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Tephrosia californiaria, 96-388. M. C. Z.
falcataria, 124-32. M. C. Z.
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Tetracis aurantiacaria (Metanema), 124-34.
=cervinaria, Pack. M. C. Z.
cervinaria (Metanema), 96-386. M. C. Z.
grotearia, 176-553. M. C. Z.
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trianguliferata, 96-384. H. E.
Thamnonoma argillacearia (Tephrina), 154-48.
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=marcescaria, Guen. M. C. Z.
ferruginaria (Eupistheria), 128-78.
=brunnearia, Thunb. M. C. Z.
flavicaria, 176-256. M. C. Z.
guenearia, 176-252. M. C. Z.
quadrilinearia (Halia), 124-26.
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sulphuraria (Eupistheria), 128-77.
M. C. Z.
tripunctaria (Halia), 124-26.
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Thera contractata (Cidaria), 128-56. M. C. Z.
Tornos approximaria, 176-215. M. C. Z.
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Agrotis littoralis, 30-36. M. C. Z.
okakensis, 30-38. M. C. Z.
ortoni, 63-63. =saucia, Hübn. M. C. Z.
umbrata, 30-37. M. C. Z.
Anarta bicycla, 30-41.
=melaleuca, Thunb. M. C. Z.
nigro-lunata, 30-40.
=melanopa, Thunb. M. C. Z.

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Heliophila rufostrigata (Leucania), 30-36.
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Palindia geminata, 63-64. M. C. Z.
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furcilla, 6-374. B. S. N. H.
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Adoneta leucosigma (Cyclopteryx), 6-346.
Antarctia bicolor, 63-63. M. C. Z.
punctata, 6-123. M. C. Z.
Apatelodes, 6-353.
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=angelica, Gr. M. C. Z.
Arachnis picta, 6-126. M. C. Z.
Arctia pallida, 6-118.
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Byssophaga grisea (Cisthene), 112-84.
=nexa, Boisd. M. C. Z.
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ornata, 6-115.
Callimorpha vestalis, 6-108.
=*var. of* Lecontei, Boisd.
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umbrata, 112-85.*
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=*var. of* biguttata, Pack.
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* Type lost in the mail.—Hy. Edwards.

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†According to Smith (Trans. Amer. Ent. Soc., v.12) none of the genera mentioned except *Glaucopis*, belong to the *Zygœnidæ*. It is more convenient however, to catalogue them here.

‡Originally described as a *Psychid*. Stretch (Ill. Zyg. & Bomby., p. 90) places near *Procris* and *Ctenucha* "chiefly because unable to assign it a more satisfactory position." Later, Packard accepted Stretch's view. Butler (Papilio, v. 1, p. 131) contends that the larva and pupa show no affinity to *Zygœnidæ* or *Psychidæ*; that the structure of the imago scarcely differs from *Hyrmina* of the *Dioptidæ*. Grote in his check-list (1882) follows Butler. Mr. J. B. Smith writes me that the genus is an abberent one and is "more *Lithosid* than anything else."

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